

Social and Health Impacts of Disability in Iowa:  
Analysis of the 2008 BRFSS Data

**Prevention of Disabilities Policy Council**

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# Disability Report- BRFSS 2008

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## Executive Summary

This report is a follow-up to the *Disability in Iowa: Health and Social Characteristics of Iowans with Disabilities (2002-2007)* and provides an in depth analysis of disability as it relates to co-morbid conditions, its impact on access and social disparities.

The key findings were:

- Disability prevalence: From 2002 to 2008, 18% of non-institutionalized adult Iowans consistently reported having some form of disability.
  - Physical disabilities constituted 89% of all disabilities, followed by emotional disorders (such as bipolar and other psychiatric illnesses). The majority of people with disability (PWD), over 67%, reported their condition starting within the prior year. The disability prevalence was strongly associated with age. The prevalence of disability was not significantly different by gender, race and living in a rural area. Veterans have significantly higher prevalence of disability than non-veterans.
- PWD suffer from worse health outcomes and increased risk of associated or co-morbid conditions than people without disability (PWOD).
  - On average across all age groups, PWD had a higher prevalence of “Fair to Poor Health”, 35% vs. 6% for the 18 to 64 age range and 42% vs. 15% for the 65 and older age group. The average number of days in a month with impaired health was greater among PWD irrespective of age (on average, 10 days vs. 2 days). Despite having poorer health status, PWD were less likely to receive needed emotional support than PWOD.
  - The prevalence of chronic conditions was greater among PWD. Cardiovascular disease rates were five times higher for those between the ages of 18-64, and two times higher for those older than 65 years of age. Chronic pulmonary disease rates were significantly higher, with 10% for emphysema, 12% for chronic bronchitis and 14% for asthma. Diabetes rates were higher among PWD. Those ages 18-64 were four times more likely to report doctor diagnosed diabetes while those 65 and over had an 80% increased risk.
  - Using the presence of chronic conditions to assess the risk of disability, the analysis indicates (after controlling for the effects of age, sex and veteran status) significantly higher risks for reporting a disability among Iowans with Asthma (OR= 2.6), Chronic Bronchitis (5.7), Diabetes (2.4), Heart Disease (2.8), and Stroke (2.5).
- Behavioral risk factors among people with disabilities vary by age group and type of risk factor.
  - PWD have greater rate of smoking among the 18-24 age group, 29% vs. 20%, but not different among the 65 and over.
  - PWD were more likely to be current smokers and less likely to be never smokers.
  - The 30-day alcohol use, binge drinking and heavy drinking prevalence was lower among PWD aged 18 to 64 compared to those without disabilities.
  - PWD were less likely to report exercising in the past month (61% vs. 80% in those aged 18 to 64; 52% vs. 75% in those 65 and older).
  - Seat belt use among PWD is very high. More than 82% of Iowans reported always using their seat belt.

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- While people with disability in Iowa tend to receive preventive health screenings at the same rate as those without, they generally rely on governmental health care programs for their health coverage at higher rates and have fewer resources to pay other out-of-pocket health costs.
  - Iowa appears to do a good job providing preventive services to its constituents. Across all age groups, the proportion of Iowans with disability who received screening tests was not significantly different from the proportion of Iowans without disability.
  - Even though most Iowans have insurance coverage, some health care access disparities exist. PWD were more likely than those without to:
    - Receive their insurance from governmental programs such as Medicaid, Medicare and the military (60% vs. 28%),
    - report being turned down for health insurance (5.4 vs. 2.2%),
    - spend less money on basic health needs (14.1 vs. 4.2%), and
    - skip medications (13.7 vs. 4.0%) because of cost.
  
- People with disability had greater social disparity than those without, including higher divorce rates, lower rates of employment and income, and less attainment of higher educational degrees.
  - PWD were more likely to be divorced (12.9 vs. 6.4%) than PWOD.
  - PWD were less likely to be employed (50 vs. 70%) than PWOD.
  - PWD earn lower levels of income (less than \$25,000 annually) at higher rates than PWOD (38% vs. 13%)
  - PWD attain a higher (graduate) level education at lower rates than PWOD (24% vs. 31%).

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## Introduction

The surgeon call to Action in 2005 estimated that between 45 to 50 million Americans “are living with at least one disability”, which may have started at birth or been acquired during their lifetime. Since 1991 with the American with Disability Act up to the endorsement of World Health Organization (WHO) International Classification of Disease and Functioning, the disability question has been approached differently from one surveillance system to another. Working towards a common conceptual framework, the IOM defined disability as “inability or limitation to performing activity and roles expected within a social and physical environment” or as a “gap between the person’s capacities and the demands of relevant socially defined roles and tasks in a particular physical and social environment”. This new understanding of disability is moving away from the disease model to the more comprehensive model taking into account personal-body structures and function- and environmental and contextual factors. Unfortunately, the department surveillance system has not caught up with the new definition.

The department presented earlier in 2008 a baseline report using two data sources, the American Community Survey (ACS) and the Behavioral Risk Factor Surveillance System (BRFSS) from 2002 to 2007. The baseline report looked at the association between disability as an outcome and risk factors such as demographics and co-morbid conditions. This report as a follow up to the baseline report provides in depth analysis of disability as it relates to co-morbid conditions, its impact on access and social determinants. We only focused on the 2008 BRFSS, which had several state questions pertaining to access added to the Core.

## Methods

### ***Description of the BRFSS:***

The Iowa Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing telephone survey financially and technically supported by the Centers for Disease Control and Prevention with further financial support from public and private sources within the state. The BRFSS is designed to collect information on the health conditions, health risk behaviors, attitudes, and awareness of residents age 18 and over. It also monitors the prevalence of these indicators over time. Only adults residing in households were interviewed. People residing in group homes or institutions were not sampled. Households were selected using list-assisted random-digit dialing. This method provides a list of randomly chosen phone numbers from the pool of all existing phone numbers. These numbers are not drawn in a simple random fashion, but use what is known as the disproportionate stratified sampling technique (DSS). This sampling methodology was designed to produce a random sample of Iowa telephone numbers, including unlisted numbers and new subscribers in an efficient fashion<sup>1</sup>.

### ***Statistical Analysis:***

When analyzing BRFSS data, inference is made about the entire adult population of the state of Iowa. However, since only people from a randomly chosen sample are asked the questions, the true prevalence in the population can only be estimated according to weighting procedures that account for the participant probability of selection. Specialized software, SUDAAN, designed to analyze hierarchical data is indicated when exploring the BRFSS data.

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Any participant who answered yes to one of the following questions, were considered having a disability: “Are you limited in any way in any activities because of physical, mental, or emotional problems?” and “Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?” Disability was considered in some cases as an outcome or an exposure depending on the question. Multivariate modeling to assess risk factors related to disability among adults lowans was also applied.

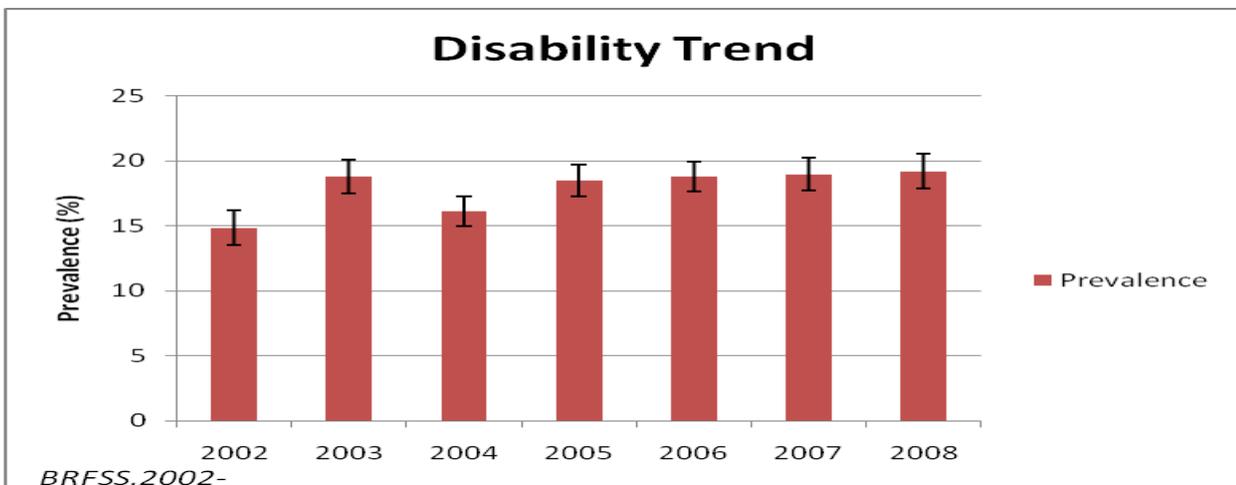
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## Results

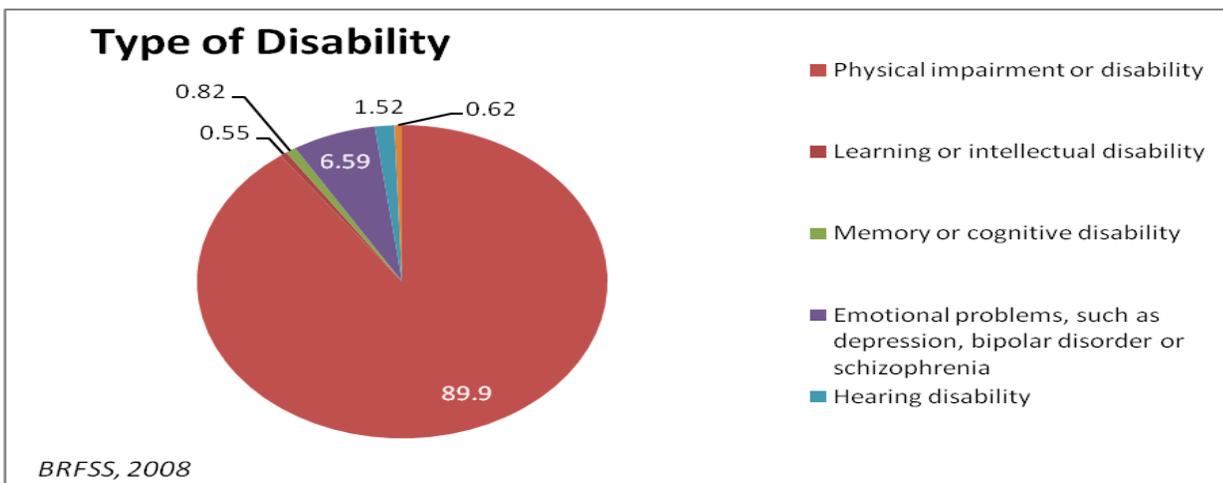
### Disability Prevalence and Demographics

The prevalence of disability among non institutionalized adult lowans has been stable over the years. From 2002 to 2008, 18% of adult lowans reported having a disability except for 2004 with only 15% (Figure 1). Though the differences are not statistically significant, we note that in 2008 the prevalence was nearly 19% which may be due to the natural aging of lowans. lowans with disability were asked to characterize the type of disability, whether physical or mental, and to indicate the duration of the disability.

Physical disabilities constituted 89% of all disabilities followed by emotional disorders such as bipolar and other psychiatric illnesses (Figure 2). The majority of the participants, over 67%, reported their disability starting within the year (Figure 3).

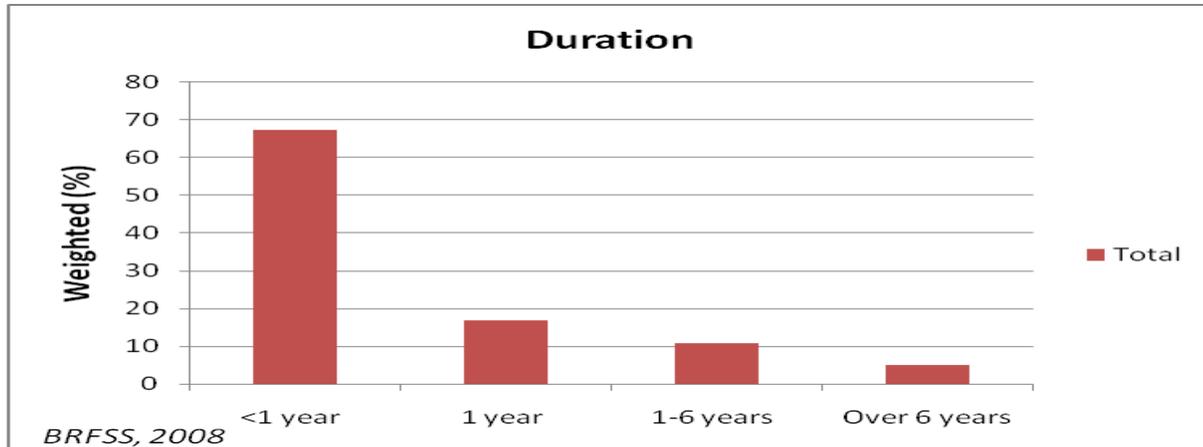


**Figure 1: Disability Prevalence, 2002-2008**



**Figure 2: Disability Type Distribution**

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**Figure 3: Duration of the Reported Disability**

Disability is associated with age. The prevalence of disability is greater with increasing age. The 2008 prevalence of disability was 10% for the 18-44, 22% for the 45-64 and increased to 36% for the 65 and older age groups. The prevalence of disability was not significantly different by gender; despite the fact that females had an overall prevalence of 19.7% compared to 18.7% for males. Minorities seem to have higher disability prevalence compared to Non Hispanic Whites with a respective prevalence of 22.6% and 18.9%. The difference of prevalence was not significant due to the low number of minorities in the survey sample.

With the return of veterans in Iowa, the BRFSS asked participants their military status. Not surprisingly, we found that veterans have a significantly higher prevalence of disability than non veterans, 28.5% vs. 18.0%. Contrary to common belief that rural areas have usually higher disability prevalence<sup>2</sup>, there were no statistically significant differences in disability prevalence.

**Table 1: Disability Prevalence by Demographic Characteristics, BRFSS 2008**

Variables	Description	Prevalence	95% CI
<b>AGE GROUP</b>			
	18-44	10.02	(8.24;12.14)
	45-64	22.26	(20.11;24.57)
	65+	36.18	(33.49;38.97)
<b>GENDER</b>			
	Male	18.67	(16.61;20.92)
	Female	19.68	(18.08;21.37)
<b>RACE</b>			
	Non-Hispanic White	18.91	(17.59;20.31)
	Non-White or Hispanic	22.62	(16.36;30.41)
	Don't know/Not sure/Refused	23.13	(10.63;43.22)
<b>VETERANS</b>			
	Yes	28.53	(24.6;32.82)
	No	18.04	(16.67;19.5)
<b>COUNTY</b>			
	Rural	38.97	(33.51;45.1)
	Urban	37.91	(33.05;43.31)

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## Associated Health Conditions

Since the BRFSS is a cross sectional survey, it is quasi impossible to determine which conditions were responsible for the actual disability or whether the disability was the root cause of the chronic conditions. We are only able to determine general association, not causal relationship. The 2008 BRFSS included a time duration indicator, which allowed us to determine whether the disability condition occurred within the last year or longer, but does not so for the associated chronic conditions. The actual research shows that people with disability have a higher risk for developing secondary conditions or having an aggravation of their primary health condition following their primary disability (IOM, 2007)<sup>3</sup>.

In this report, we assessed the general and mental health status of lowans with disability, the median number of days of poor health, the prevalence of chronic diseases, such as asthma, emphysema and chronic pulmonary disease, cardiovascular diseases including Heart and Stroke, and metabolic disorders such as obesity and diabetes. This report also included behavioral risk factors such smoking, drinking, and driving while intoxicated, and screening rates for prostate, breast cancer and colon cancer.

### **General Health Status:**

As a measure of health status and quality of life, the BRFSS asked participants to rate their general health in terms of “excellent, very good, good, fair or poor”, and to estimate the number of days in the past 30 days when their physical, mental or either were not good (see BRFSS questionnaire for details). On average across all age groups, PWD had a higher prevalence of “Fair to Poor Health” with values reaching 35% and 42% for the 18 to 64 and the 65 and older age groups respectively compared to 6% and 15% among PWOD (Figure 2). In 2008, the average number of days with Impaired Health was greater among PWD irrespective of age. On average PWD reported ten (10) health impaired days due to poor health in the month compared to two (2) days for PWOD. Among PWD, physical health issues were responsible of on average 10 days of health impairment while mental health issues averaged four (4) days. Age was associated with the number of health impaired days. While the average number of health impaired days was greater with increasing age for physical health issues, the 18 to 64 age groups presented greater number of days for mental health reasons with respective averages of 6.6 vs. 2.4 days (Figure 5).

Despite having poorer health status, PWD were less likely to receive needed emotional support than PWOD. Compared to the 18 to 64 years old among PWOD, the elderly were more likely to “rarely or never receive” needed emotional support. On the contrary among PWD, the 18 to 64 years old had a higher proportion of “rarely or never receive” needed emotional support. The proportion of PWD who said that they “rarely or never” receive emotional support was twice higher among the 18 to 64 compared to PWOD belonging to the same age group, 10% vs. 4%. The proportion difference tapered off with age as it is only marked among PWOD (Figure 6).

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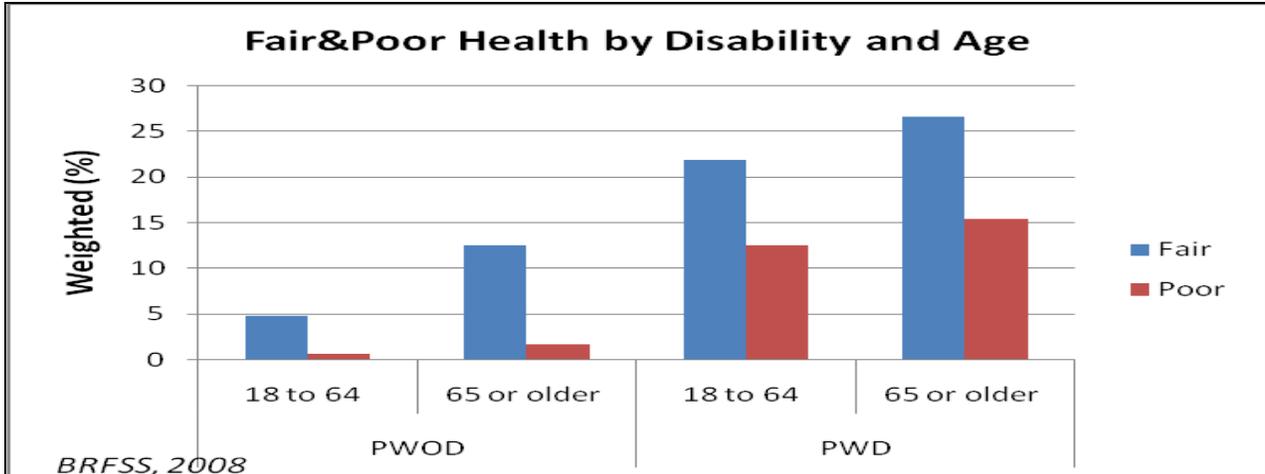


Figure 4: Fair and Poor Health Status by Disability and Age

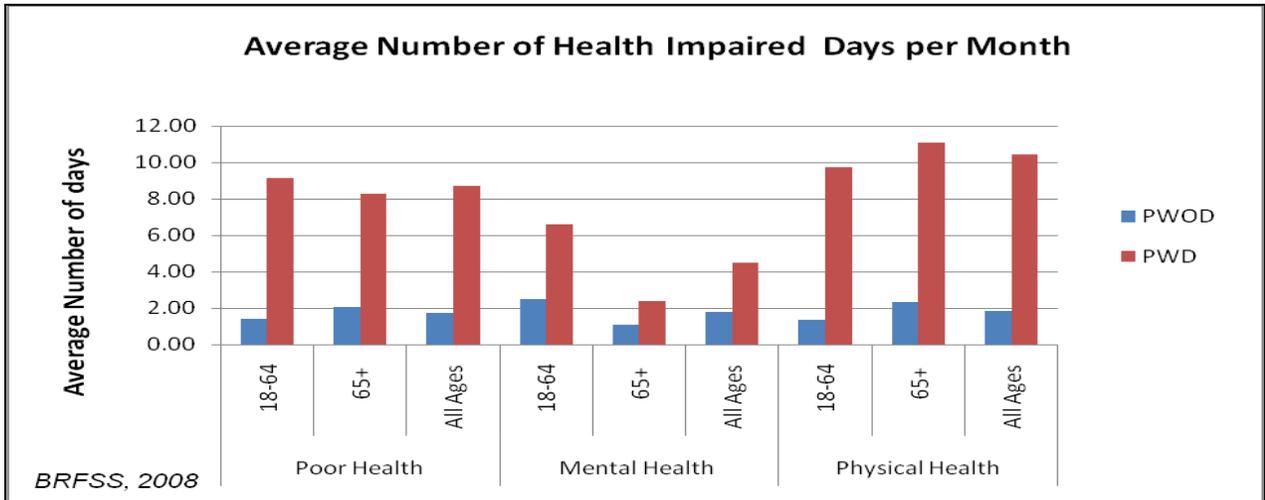


Figure 5: Average number of Health Impaired DAYS by Disability

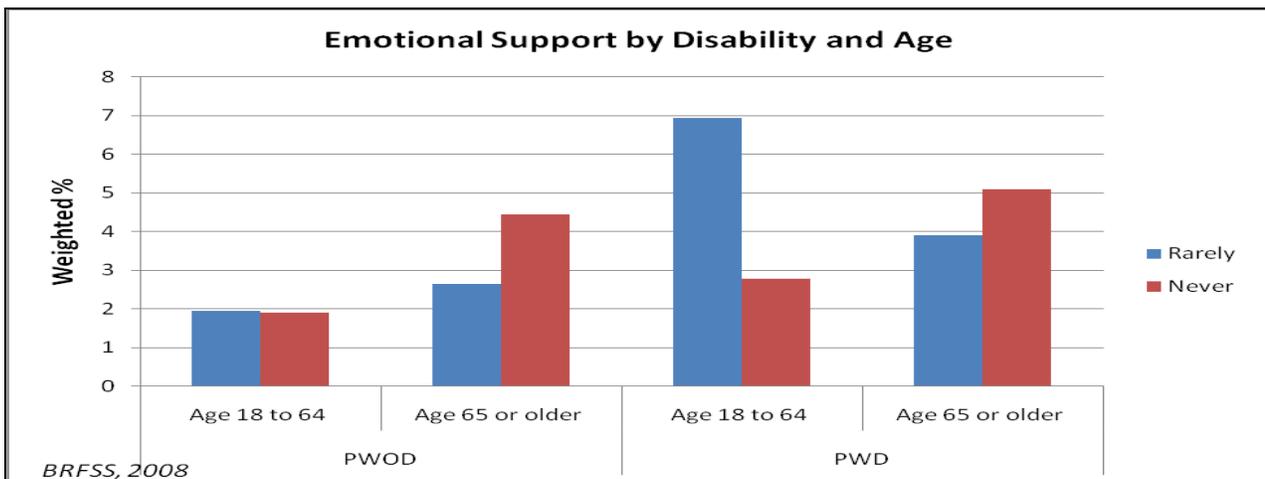
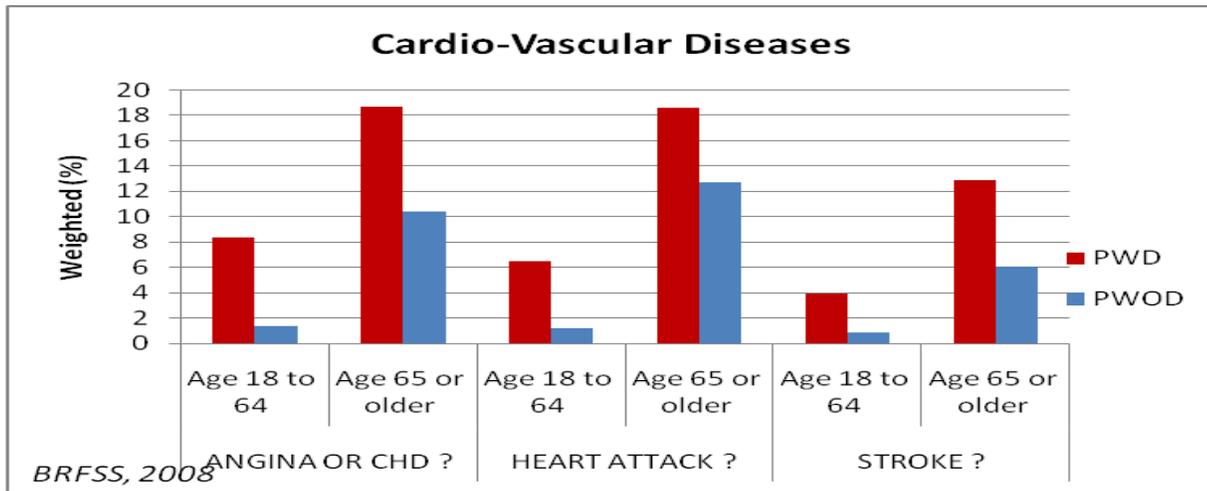


Figure 6: Emotional Support by Disability and Age

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## Cardio vascular diseases:

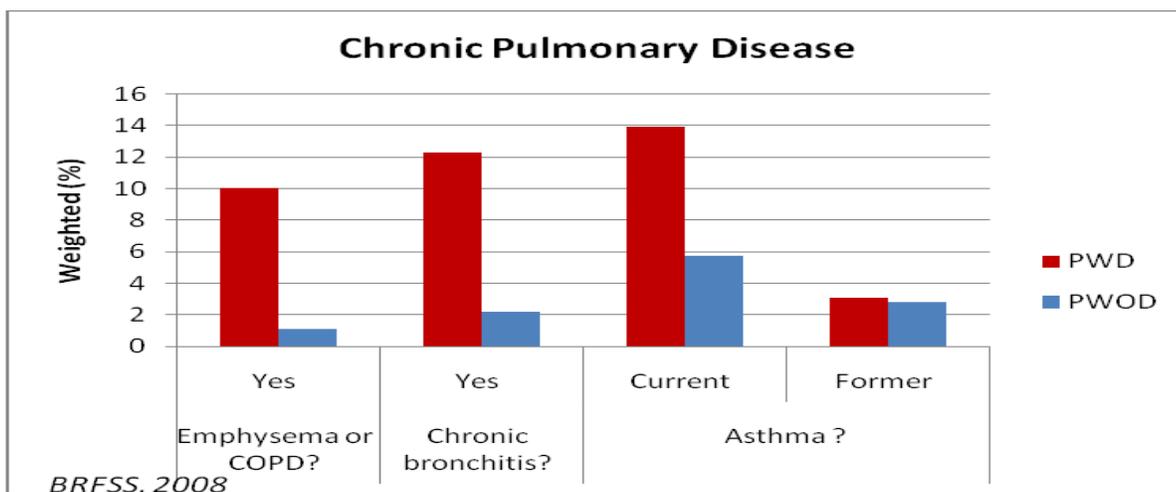
Cardiovascular diseases prevalence increases with age. The prevalence of cardiovascular disease consistently was higher among PWD across the different age groups. Compared to PWOD, the prevalence of heart diseases, as manifested by angina and heart attack, was on average five times higher for PWD between the age of 18-64 and two times for those older than 65. The same trends applied for stroke prevalence. The prevalence of stroke among PWD 18-64 years old was around 2% and over 12% for those older than 65. Among PWOD, over the age 65, we see that the prevalence was 8%.



**Figure 7: Cardio-Vascular Diseases Prevalence by Disability Status**

## Pulmonary Diseases:

When asked, PWD were more likely to report having emphysema, chronic bronchitis and to be currently suffering from Asthma. The prevalence of chronic pulmonary disease among PWD was respectively 10, 12 and 14% for emphysema, chronic bronchitis and asthma. The prevalence was significantly higher compared to PWOD.

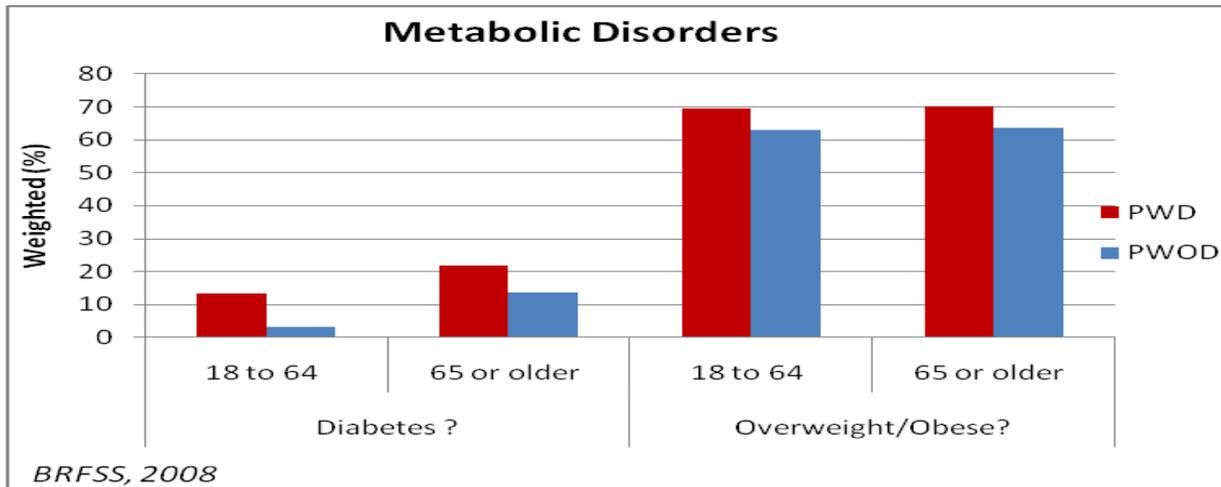


**Figure 8: Pulmonary Diseases Prevalence by Disability Status**

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## **Metabolic Disorders: Obesity- Diabetes**

For other chronic conditions such as overweight and obesity, the prevalence was not significantly different among PWD compared to PWOD. There was a tendency of increased risk of overweight among PWD but the difference was not statistically significant. However, PWD had a greater risk for diabetes independently of the age groups. As PWD 18-64 years of age were four times more likely to report Doctor diagnosed diabetes compared to PWOD from the same age strata with respective prevalence of 13 vs. 3%. Likewise, PWD older than 65 had a greater risk of diabetes; though the risk ratio was quite lower with only an 80% increased risk.



**Figure 9: Obesity and Diabetes Prevalence by Disability Status**

## **Predictive Modeling**

Adjusting for age, gender and veteran status, we modeled the odds for having a disability while suffering from chronic co-morbid conditions such as Chronic Bronchitis, Asthma (lifetime), Heart attack, Stroke and Diabetes. In this enterprise, disability was the outcome and the predictor variables the chronic conditions. The variables were tested independently. Associated chronic conditions were good predictors of disability. After controlling for the effect of age, sex and veteran status, the risks for reporting a disability were significantly higher for lowans with Asthma (OR= 2.6), Chronic Bronchitis (5.7), Diabetes (2.4), Heart disease (2.8) and Stroke (2.5).

**Table 1: Adjusted-Odds Ratios for Disability**

Independent Variables/Main Effects*	Odds Ratios (OR)	95%CI
Asthma	2.6	(2.3; 2.9)
Chronic Bronchitis	5.7	(3.9; 8.1)
Diabetes	2.4	(2.2; 2.7)
Heart Disease	2.8	(2.4; 4.3)
Stroke	2.5	(1.8; 3.5)

\*Adjusted for age, sex, and veteran status

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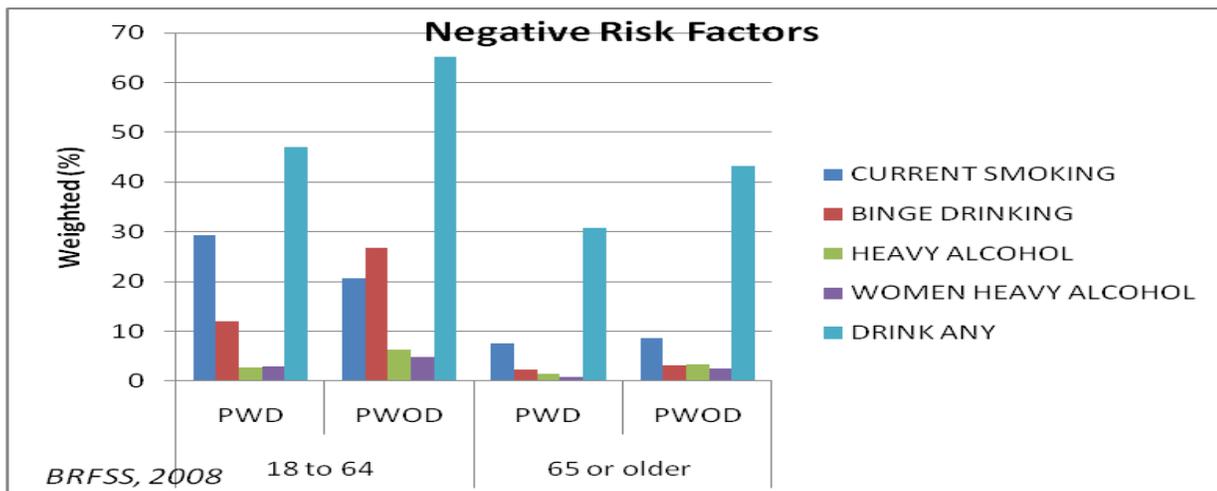
## Behavioral Health Attitudes

To assess the negative health habits of lowans and how they relate to disability, we explored drinking and smoking.

Binge drinking and Heavy drinking was defined respectively, as having 5 or more drinks (4 for females) on one occasion in the past 30 days and consuming two or more drinks (one for female) per day every day. As for current drinkers, it was defined as having any drink of alcohol in the past 30 days. Survey participants were identified as current smokers when they reported smoking cigarettes every day or some days in the past 30 days.

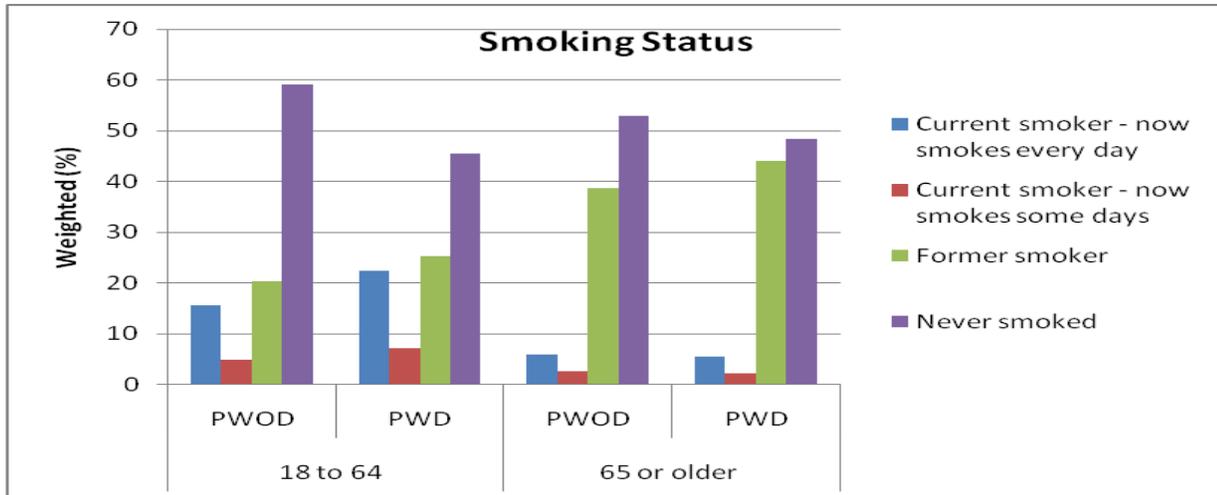
lowans with disabilities were more likely to smoke cigarettes from 18 to 64 years of age than those without disabilities. The proportion of smokers among PWD was significantly greater 29% vs. 20% for the 18-24 but not so much different for the over 65. PWD were more likely to be current smokers and less likely to be never smokers. This indicator is very important since it brings to fore the issue of smoking as the cause of disability. Of lowans with disability, 45% never smoked in their lifetime (vs. 59%) and 22% smokes every day (vs. 15%). On the other risk factors, lowans with disability had a lower prevalence of 30 day alcohol use and binge drinking (Figure 10). The findings were particularly significant among the 18 to 64. Heavy drinking prevalence was lower for PWD but only significantly different for the 18 to 64. Heavy drinking was not so much different in women.

Looking what lowans are doing to protect their health, we used two indicators - seat belt use and exercise - that are very important in prevention to have a sense of protective health behaviors. More than 82% lowans reported always using their seat belt (Figure 11). There were no differences by disability status and across the age groups. However, people with disability reported a lesser inclination for exercise. Compared to lowans without disability, lowans with disability 61% (vs. 80%) in the 18 to 64 and 52% (vs. 75%) for the 65 and older reported engaging in any exercise in the past month (Figure 12).

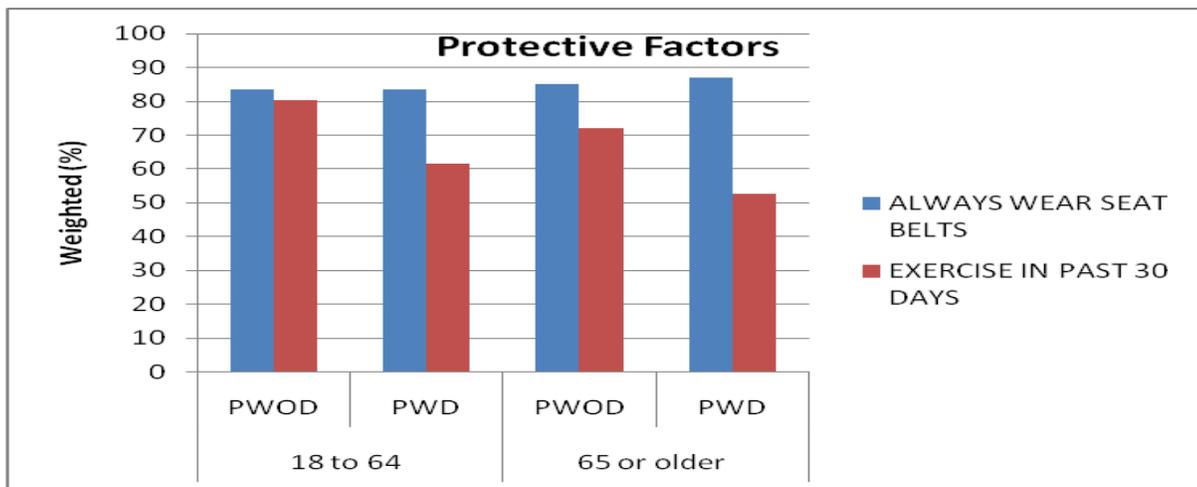


**Figure 10: Behavioral Risk Factors by Disability Status**

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**Figure 11: Cigarette Smoking Status**



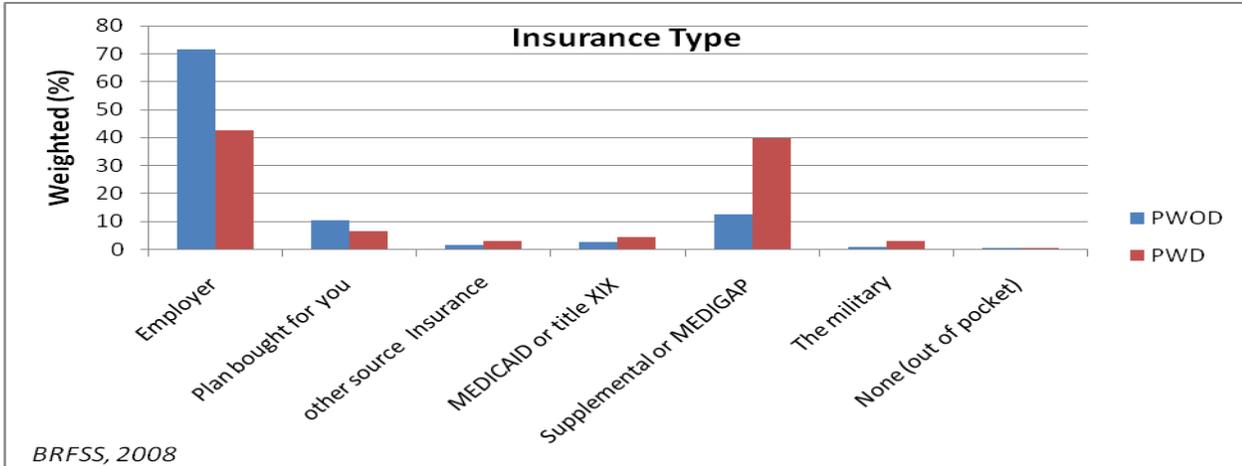
**Figure 12: Protective Risk Factors**

## Health Care Access

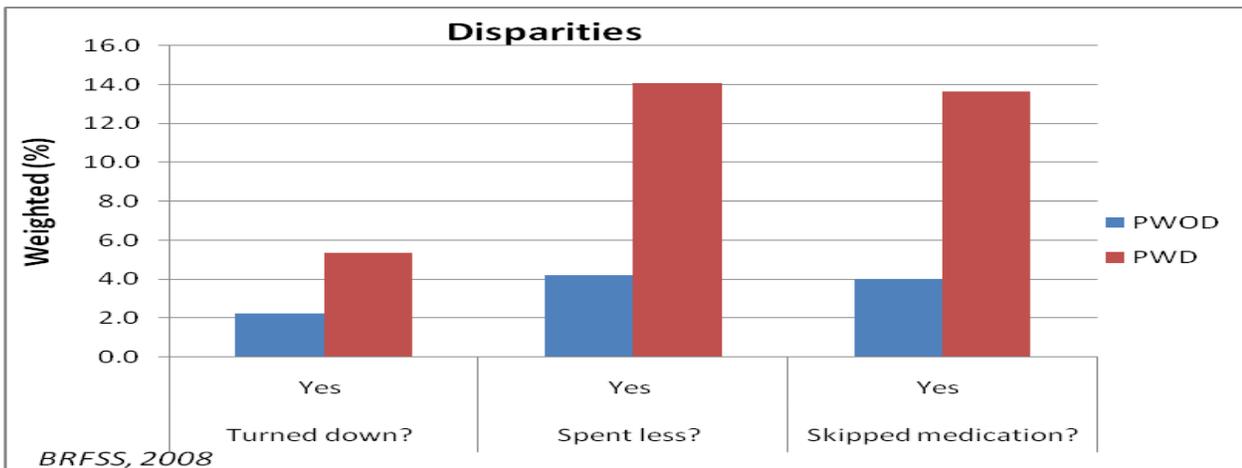
### Insurance coverage and access to services

The State of Iowa has generally good health care coverage for its resident 65 and older. Over 95% of elderly lowans have health insurance and access to medical professionals such as personal doctor. Because of that, we limited the health care insurance, the medical and dental home analyses to the 18 to 64 years old. Even though most lowans, 18-64 years old, reported health insurance coverage, PWD (60% vs. 28%) were more likely to receive their insurance from governmental programs such as Medicaid, Medicare and the military (Figure 13). PWD were more likely to report being turn down for health insurance (5.4 vs. 2.2%), spent less money on basic health needs because of cost (14.1 vs. 4.2%), and skipped medication (13.7 vs. 4.0%).

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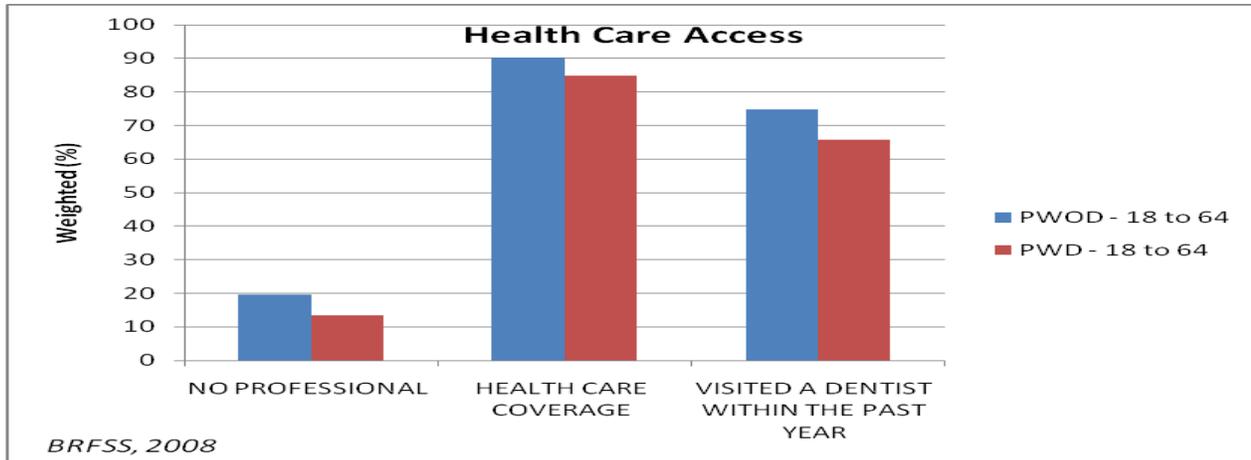
**Figure 13: Health Insurance Type by Disability**



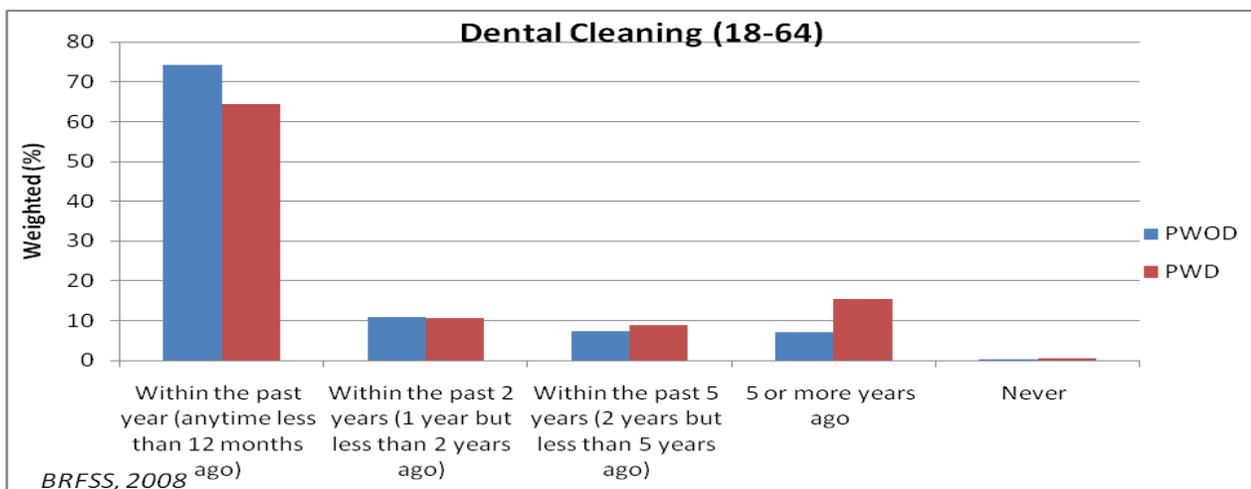
**Figure 14: Access Disparities due to Cost by Disability Status**

In general, there were no significant disparities in terms of insurance coverage and having a dedicated health professional due to disability status. Less than 20% of lowans do not have an identified personal health professional. But in terms of visiting a dentist, lowans with disability are significantly less likely to have visited a dentist within the last year (Figure14). Nearly 64% of lowans with disability reported having their teeth cleaned within the last year, which was significantly lower than the 74% of PWOD (Figure 15).

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**Figure 15: Insurance, Personal Health Care Provider, Dental Visit by Disability Status**



**Figure 16: Time Last When Had Teeth Cleaned**

## Screening

Screening is an integral part of prevention. Across all age groups, the proportion of lowans with disability that had screening tests was not significantly different from the proportion of lowan without disability. On average, among women over 75% completed the Pap smear and mammogram screenings. The completion rate of blood stool test in both groups was very low corresponding to 1 in 5 for lowans 18-64, and 1 in 4 for the 65+ age group. This may just represent the change in screening prescription for colon cancer since 70% of lowans older than 65 reported having a sigmoidoscopy. The proportion of lowans who had a sigmoidoscopy was not different by disability status and age group (Table 2).

The state of Iowa seems to be performing well regarding issues around immunization. More than 70% of lowans over the age of 65 received flu shot independently of disability status.

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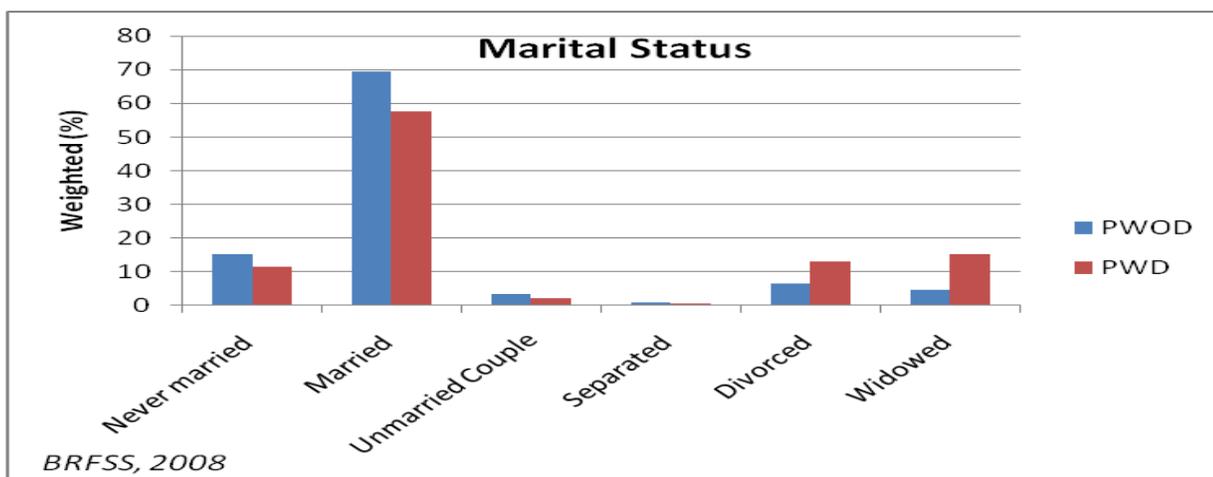
**Table 2: Prevention Service Health Disparities**

AGE / DISABILITY	18 to 64		65 or older	
INDICATORS	PWOD	PWD	PWOD	PWD
18+ PAP-SMEAR TEST IN THE PAST THREE YEARS	87.51	85.14	72.27	63.9
WOMEN AGED 40+ MAMMOGRAM	76.05	72.55	82.35	72.73
50+ MAMMOGRAM PAST TWO YEARS	80.13	75.75	78.05	71.14
50+ BLOOD STOOL PAST TWO YEARS	20.1	21.59	26.28	24.84
51 OR OLDER SIGMOIDOSCOPY	55.05	63.52	70.66	72.14
AGED 40+ PSA TEST IN THE PAST 2 YEARS	44.79	44.15	79.74	70.26
EVER BEEN TESTED HIV	28.79	33.01	NA	NA
FLU SHOT	NA	NA	75.35	81.47

## Social Disparities

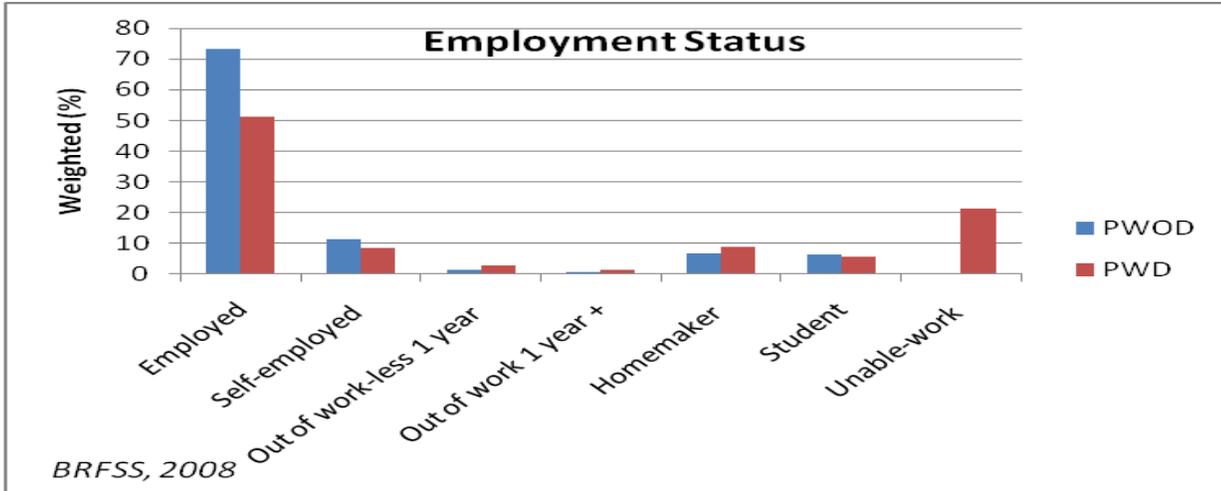
Disability is a cause of social disparities. As symptoms and functional limitations limit work ability and affect interpersonal relationships, PWD may have concerns about future health, employment, body image, and having children and affect decisions about marriage and childbearing<sup>4</sup>.

Iowans with disability were significantly more likely to be divorced (12.9 vs. 6.4%) and to be widowed (15.3 vs. 4.7%), (Figure 16). The greater proportion of widows or widower among PWD may also be confounded by age. In terms of employment, income and educational attainment, PWD were less likely to be employed, earn money and have graduate level education. On average 20% of PWD reported inability to work, which reduced the employment rate to 50% compared to 70% among PWOD (Figure 17). There was no difference in the proportion of homemakers (8.6 vs. 6.7), students (5.8 vs. 6.4), and self-employed (8.6 vs. 11.2). Considering income level disparities, PWD reported lower income with 38% earning less than \$25,000 compared to 13% among PWOD (Figure 18). Interestingly in Iowa, PWD have the same proportion of people who attended college level education, which reached 30% (Figure 19).



**Figure 17: Marital Status by Disability**

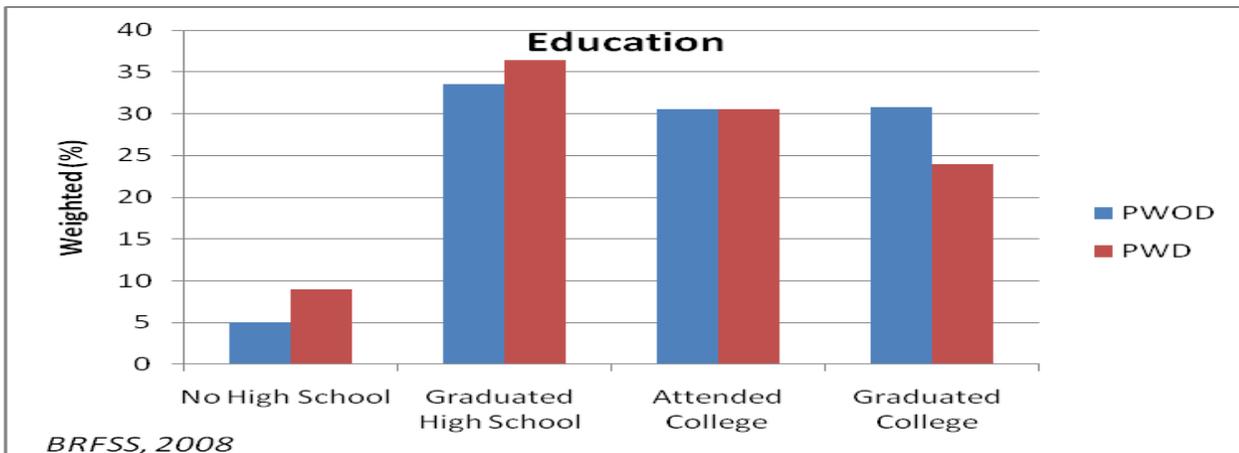
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**Figure 18: Employment Status by Disability**



**Figure 19: Income level by Disability**



**Figure 20: Educational Attainment by Disability**

## Discussions

### Findings

According to the CDC because of the baby boomers, the number of adults reporting a disability will increase, along with the need for appropriate medical and public health services. In 2005, despite the fact that Baby Boomers (persons aged 45--64 years) have a lower prevalence of disability as a group, the number of people reporting disabilities became equal to the number of persons aged  $\geq 65$  years reporting disabilities. When they enter the  $\geq 65$  year age group, the absolute number of persons affected likely will increase substantially. The same prospect seems to be happening in Iowa. With the aging of the population, even though the prevalence of disability is lower compared to the nation (22%), the magnitude of the problem will certainly increase over the years.

### Data limitations

The BRFSS collects self-reported information on many of the behaviors and conditions that increase the risk of chronic disease among adults, 18 years and older. The BRFSS is not intended for children surveillance. Each sample of the BRFSS is weighted to the respondent's probability of selection and to the age- and sex-specific population or age-, sex-, and race-specific population of each state, which allows generating state point estimates. It is a good and valid surveillance system but has limitations since the BRFSS is a cross-sectional survey. Causality and the direction of the multivariate results cannot be determined even with the inclusion of time factor. In addition, only non-institutionalized adults are included limiting the generalizability of findings as older people are more likely to live in residential communities and nursing homes.

Earlier surveys were limited to landlines. Until 2008, cell phone users, hence a great deal of youth 18-24 and college students were under selected. In 2008, IDPH piloted a number of cell phones survey to increase the catchment of youth, 18-24. The results did not show inconsistencies with landlines responses.

### Other sources of surveillance

There are other sources of surveillance. The American Community Survey (ACS) and the National Health Interview Survey (NHIS) provide more specific information on disability. Their definition of disability is different compared to BRFSS. The NHIS, modeled on the ACS, had a comprehensive module specially designed for disability, but unfortunately was implemented last in 1997.

## Conclusions

This report is a follow up to the baseline report, which explored two data sources to assess disability. Adult Iowans with disability compared to those without are faced with several challenges. They are more likely to suffer from debilitating chronic conditions and social disparities. Despite the state preventive services and health care access facilitation - health clinics, screening and Immunization- Iowans with disability have to choose between food and needed medicines. They were more likely to forego needed medicine because they cannot afford them.

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## APPENDIX

For tables with raw data, excel file is available at this link: [http://www.idph.state.ia.us/bh/disability\\_health.asp](http://www.idph.state.ia.us/bh/disability_health.asp)

## REFERENCES

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(<http://www.idph.state.ia.us/brfss/common/pdf/2008BRFSSannual.pdf>)

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